Project Summary

US Army Engineer
Research and Development Center
Waterways Experiment Station

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U.S. Army Centrifuge Research Center

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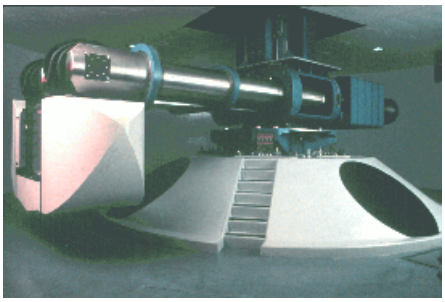
Objective: To allow economical evaluation of alternative designs, investigation of complex problem areas, and validation of numerical methods with instrumented physical models.

Approach:

The Army has inaugurated the operation of a unique, powerful engineering centrifuge which will provide new and novel research capabilities for the Corps of Engineers. Development of the research equipment was done with the assistance of Andrew N. Schofield and Associates, Ltd. of Cambridge, UK. Detailed design and fabrication of the centrifuge was carried out by Acutronic USA, Inc. The Corps of Engineers centrifuge has a radius of 6.5 meters and has been tested to its maximum payload of 8,000 kg at 143 g acceleration, decreasing to 2,000 kg at 350g.



ERDC (formerly Waterways Experiment Station) has a successful, 2-decade history of applying centrifuge techniques in the solution of high priority challenges to the Army. Early pioneering work on weapons effects in the mid-1970's was followed by research projects on liquefaction, erosion of dams, and earthquake engineering.

Recent world-wide interest in centrifuge modeling has concentrated on geotechnical applications; however, the Army centrifuge research facility has a much broader mission, addressing research needs in physical modeling across the full range of engineering applications. Research investigations in the fields of geotechnical, structural, hydraulic, environmental, physics of frozen soil and water, and coastal engineering are planned. Studies will be possible under climatic conditions ranging from desert to polar to ocean regions.

The Army centrifuge is unique in its intended applications for research. The new capabilities that will flow from the centrifuge will depend on the ingenuity of its users and the design of its appurtenances. This facility is available for use by both government and non-government researchers.

URL: http://geoscience.wes.army.mil/CentrifugeResearchCenter.PDF